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### FINAL EVALUATION

## RURAL WATER SUPPLY PROJECT LIMPOPO CORRIDOR GAZA PROVINCE 1994 - 1995, PHASE II



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## FOREWORD

The main objective of an evaluation of a village water supply and sanitation project is to demonstrate the success of the project in relation to its objectives, providing a check on the use of funds and give recommendations for future similar projects.

Due to the limited time available for this evaluation mission and reporting, the main objective of this evaluation mission was not to compare a baseline study with the objects and impact of the project in terms of percentage of specific indicators.

This evaluation report describes by necessity only the results of the main objectives of the projects and leaves therefore unfortunately a lot of interesting aspect of the projects undiscussed.

The focus of the evaluation is therefore directed to summarize the project outputs and evaluate the experience of the project to provide practical recommendations for future similar projects.

Coverphoto: *It is five o'clock in the afternoon and still a long line with some 70 watercontainers to fill. This pump will not close before nine at night.*

## EVALUATION OF THE RURAL WATER SUPPLY PROJECT "LIMPOPO CORRIDOR, GAZA PROVINCE, 1994 - 1995, PHASE II

### EXECUTIVE SUMMARY

The Rural Water Supply and Sanitation Project of World Relief Corporation (WRC) in the Gaza Province was one of the first projects in 1993 with an integrated approach. The objectives were ambitious, creation of 110 waterpoints within two years, accompanied with an education programme on water and sanitation. It is certainly a challenge for a NGO to start such a project in Mozambique in January 1994, when the country is in a complex process of restoring infra-structure and normal life and governmental coordination is also starting up again.

It is therefore gratifying to conclude that such an ambitious projects has achieved in most of its original objectives and can be considered as a example for similar projects in the sector.

Apart from the technical and organisational experience of the management, this is especially due to a very motivated project team, that worked from the start as a real team that succeeded to motivate the communities.

The direct outputs of the project is the completion in 70 communities a total number of 133 waterpoints and an estimated number of at least 1,400 improved pit latrines. Parallel with the construction activities, the communities received training in the correct use and maintenance of these facilities.

During the execution of the project, the team also gained valuable experience in the constraints of the realisation of the facilities and education of the communities. From a project like this, one of the first of its kind in this area, a lot can be learned.

Conform the Governmental guidelines Afridevs handpumps were installed in the shallow boreholes and Volanta pumps in boreholes with waterlevels beyond 50 m. At the start of the project there was little expertise and training facilities on handpump installation, operation and maintenance. Fortunately, the project team could profit from own experience from the previous WRC emergency programme and builded up more experience with all aspects of the two types of handpumps and organized several handpump workshops and participated in others.

The education programme on water and sanitation included also the construction of demonstration improved pit latrines to be copied by the communities and education on sanitation and the use of water. The project team was especially successful in communication with the communities by a participative approach based on shared activities in a temporary base camp in the working area. This enabled the animators to established a fruitful contact with the individual households which proved to be much more effective than only communicating with men and women in a group meeting.

To try to realize all necessary integrated activities at the same time, as described in the initial project objectives was to ambitious. The creation of a large number of waterpoints and latrines, baseline studies, educational and socio-economical activities, training and institutional support, etc., was not feasible within the budget and working constraints in

Mozambique for the relative small project staff.

Moreover, beside creation of facilities ("hard-ware" activities), the additional integrated ("soft-ware") activities as education, socio-economic development and institutional support require much more time to implement and should ideally be part of an independent project, associated but independent of the tight time schedule of the realisation of waterpoints.

The experience of the project and the main observations of the evaluation are summarised in a list of conclusions and recommendations.

## 1. INTRODUCTION

After the signing of the peace accord, the Mozambique Government is establishing a programme of decentralisation to restore and improve the provision of basic services to the population. In rural areas, where millions of internal and external refugees are resettling and taking up normal life again, new facilities must be constructed and existing facilities rehabilitated.

The existing facilities for water supply in rural areas covered less than 20 % of the country by the end of 1993, with large differences between provinces. The declared goal of the Mozambique Government is to increase coverage to 40 % by the year 2000, with emphasis on the least served areas.

Within the Ministry of Public Works and Housing, PRONAR (National Water Program) as a department of DNA (National Directorate of Water) is responsible for coordination, implementation and supervision of the rural water supply works nationwide. On a provincial level DAs (Water Departments) within the DPOPHs (Provincial Directorates of Public Works and Housing) are responsible for data collection and planning. The implementation of facilities are by the EPARs (Provincial Rural Water Workshops, known as "Agua Rural"). The EPARs are independent bodies under the guardianship of PRONAR, although their responsibilities are not clearly defined.

The implementation of water supply facilities in rural areas is still heavily dependent on donor funding and most of the work is carried out directly by NGOs. After some years of mainly emergency programmes, the focus of most NGOs in rural water supply projects is now gradually changing from a emergency assistance to a more integrated development approach, including more aspects of sustainable development.

The document describes the evaluation of the World Relief "Rural Water Supply and Sanitation Programme, phase II (RWSSP)" in the Districts of Chicualacuala, Chigubo, Guija, Mabalane and Massangena in the Gaza Province in Mozambique during the period of January 1994 to November 1995.

This present programme is a follow up of the World Relief "Emergency Water Supply Intervention (EWSI)" programme of 1992 in response to the EWSI recommendations and needs of the area, with the anticipated influx of refugees and returners.

The main objective of this project is to deliver water supply and sanitation facilities to communities to improve community health and the quality of life. This was done through the drilling of boreholes for handpumps and the development of a community-based water and sanitation action and education programme.

## **2. OBJECTIVES OF THE EVALUATION**

This document provides an overview of the project "End-of-Expanded Activity Status". In the evaluation of this project the infra-structure output as well as the practice and in-field project experience in all project phases were considered and recommendations are made to improve the identification, design and implementation of similar future projects.

### **2.1. General objectives of the evaluation**

The general objective of the evaluation of the World Relief Village Water Supply and Sanitation Project is to assess the success of the project in relation to its objectives, providing a check on the use of funds and give recommendations for future similar projects.

Due to the limited time available for this evaluation mission and reporting, the evaluation is focused on to the appreciation of the completed facilities in general terms of socio-economic impact. Also technical aspects and constraints are discussed. Wherever possible, the evaluation gives recommendations on modifications and actions for future or follow-up projects, to:

- get a non-functioning facility into operation;
- improve a functioning facility;
- improve the utilisation of facilities;
- improve the positive side-effects of the new facilities;
- mitigate the negative side-effects of the new created facilities;
- improve the impact of training.

### **2.2. Specific objectives**

Within the context of the above general objectives, the evaluation pays special attention to 17 specific objectives of the water supply project, as described in the project proposal of September 1993, attachment B as "End-of-Expanded Activity Status". These specific Terms of Reference (TOR) items are listed in Annex 1.

### **2.3. Working programme**

The project was visited in eight days from Friday 1st of December to Friday 8th of December 1995 of which five and a half days were spent in the field. The details of the working programme are given in Annex 2.

Based on the studied documents, field observations and conversations with the project staff, the authorities and the project beneficiaries, relevant information was obtained on:

- the functioning of the facilities;
- utilisation and impact of the facilities and training;
- institutional aspects related to the project.

In the following chapters these aspects are discussed. Specific attention is given to aspects of sustainability of the handpumps.

### 3. REALISATION OF FACILITIES

The figures of the quantitative project output were derived from the project report and confirmed by studying the project administration files. For more specific information about totals and specific characteristics of the completed facilities the reader is referred to the final project report of World Relief, December 1995.

#### 3.1. Realisation of the waterpoints

During the project a total of 156 boreholes were mechanically drilled of which 127 were equipped with a hand pump (success rate of 81%), with an average depth of 46 m. In addition to these 127 boreholes, three shallow boreholes were manually drilled and three other boreholes rehabilitated. The superstructure was generally constructed by a local person with assistance of a technician of the project.

In total 133 handpumps were installed, of which 109 Afridev type, 19 Volantas and 5 Bucket pumps.

#### Expected End-of-Expanded Project status

The project expected to have completed a total of 148 boreholes (70 deep mechanically drilled and 78 manually drilled), of which a total of 110 boreholes (expected success rate of 74%) were to be equipped with a superstructure and a handpump, providing at least 10 litres potable water per day per person.

#### Observations and discussion

The project completed 133 boreholes. Theoretically, with 7 persons per household (according to the baseline data), each borehole can supply a maximum of 70 households of 10 litres per person per day with 10 operational hours per day. This makes a total of 65,170 beneficiaries for the waterpoints.

However, this theoretical figure takes not into account the non-productive time or the Time Between Repairs (TBR) of handpumps broken down.

#### Shallow borehole programme

In the "End-of Expanded Activity Status", a total of 78 shallow boreholes are foreseen, drilled by 2 water teams of three persons, trained in the operation and maintenance of manually operated drilling rigs used by the WRC.

At the end of the project however, the number of shallow boreholes completed by the manual rig was only 4.

This was mainly due to logistical problems in the first phase of the project, when the manual drilling rig (type "Vonder Rig" from Zimbabwe) was not available for various reasons outside the control of the project staff. Later on in the project, it showed that this drilling could operate in an effective way only in special conditions. A second drilling rig was therefore not purchased by the project. The equipment of the Vonder Rig is in good order and kept by WRC on the project base in Chokwe.

Also experience from other village watersupply projects show that it is generally not feasible due to the many logistical problems to organize and to supervise a large drilling



programme and at the same time to train and execute a small own drilling programme with the project personnel.

### **3.2. Realisation improved pit latrines**

In the sanitation programme, the project constructed 16 demonstration improved traditional pit latrines in 13 villages and supplied the material for the construction of latrine slabs. These demonstration latrines were copied by the villagers, estimated total number of pit latrines constructed by individual households is over 1,400. The latrine cement slab, was constructed according to the specifications of the National Institute of Physical Planning (INPF).

#### Observations and discussion

The project expected to have completed a total of 8 model improved pit latrines constructed, cleaned, functioning and being copied by the villagers.

The project constructed 8 more demonstration latrines than foreseen. The number of copied pit latrines of over 1,400 is based on the number of latrine slabs distributed. The actual number of new improved pit latrines in the communities can be somewhat lower due to local problems with the underlying soil, the availability of suitable building material, especially for the roof.

The quality of the copied latrines was generally good to acceptable. Some villagers improved the original design to their own ideas, making really nice and proper private latrines with a door and ventilation pipes. On the other hand also latrines were constructed by the villagers with little or no ventilation or different type of slabs.

To control flies and cockroaches, a tight-fitting lid of high quality concrete is important. Unfortunately on most of the "standard" latrines the lid that covered the pit was broken in the middle or sometimes fallen down into the pit. The recommended "safety rope", to be attached to the small iron handle on the top was generally absent or too short and touching the ground.

## 4. FUNCTIONING OF FACILITIES

Functioning of facilities and services were assessed wherever possible by engineering inspection and scientific observation. For instance, several broken down pumps and pump repairs were examined in order to reveal if the cause of breakdown was due to improper installation or repair of the pump or due to pump design or other specific local conditions.

### 4.1. Functioning of the handpumps

Indicators for the correct functioning of the water supply facilities are the water quality and quantity, the reliability of the water supply and the convenience of the location.

#### Water quality

The water quality was generally good to acceptable, although part of the project area has brackish to salt groundwater. The project management was well aware of these problems and avoided drilling in zones where salt groundwater was to be expected, or initiated additional geophysical studies to locate fresh groundwater within these unfavourable areas. Unfortunately these geophysical studies couldn't be executed before the end of the drilling activities. Consequently several boreholes (with brackish groundwater) had to be abandoned and in some villages no suitable sites could be identified and were left out of the programme.

#### Water quantity

All handpumps could provide 10 litres per day for a community of 500 people, with a production between 500 to 1000 litres per hour per borehole. The production of the boreholes with deeper water levels was generally up to 50% less compared with the shallow boreholes.

#### Reliability of the water supply

The reliability of the water supply was generally good, with an exception of the handpumps on the deeper boreholes that were equipped with Volanta pumps. On several Volanta pumps the Time Between Repairs (TBR) was sometimes less than one month, mainly due to the breaking or leaking of the rising main.

The project staff discussed these problems with the supplier but due to the limited experience in Mozambique with deep waterlevels a final solution couldn't be found before the closing of the project.

#### Borehole locations

Most of the boreholes could be conveniently located on the sites indicated by the community due to the presence of continuous aquifers with fresh groundwater. On some locations preferable borehole sites had to be abandoned due to the presence of brackish groundwater.

Follow-up programme on technical assistance, the MMM-Unit

The project anticipated very well on the need of the communities for technical assistance and distribution of spare parts for the more complicated repairs of the new pumps. For the period of one year a World Relief post-project technical assistance team of two technicians based in Mapai and three technicians with a fourwheeldrive based in Chokwe, the Mobile Maintenance and Monitoring Unit (MMM-Unit) was proposed.

However, the period of one year is probably too short and although these technicians are well trained during the project, they will need additional backstopping and training. Also an evaluation of their activities and problems would be of interest to estimate the feasibility of future mobile support units.

## 4.2. Sustainability aspects

All new infra-structure should be sustainable, which implies that the responsible institutional framework must be able to supply technical and financial support to keep the facilities in a good working condition. However, within the present institutional framework in Mozambique, the responsibilities of maintenance of infra-structure in the rural water and sanitation sector are not clearly defined.

For the handpumps in principle the VLOM concept (Village Level Operation and Maintenance) was adopted, i.e. that the handpumps should be relatively simple and handed over to the community. At the same time the community was motivated and trained to take care for the maintenance and repairs of their pump.

Observations and discussion

To finance the pump repairs the project initiated a basic system of responsibilities within the community in which the beneficiaries for each individual pump in the communities pay a contribution (per person or per household) to a pump caretaker. The project suggested to the communities to organise the maintenance at the lowest level, but anticipated very well to the different local institutional and political possibilities and constraints. The final decision how to organise and implement the maintenance system was made by the communities.

The general impression from conversations with the beneficiaries and pump caretakers during the field visits is very promising and especially in the smaller communities people seem to be willing to contribute in the maintenance and to pay for the pump services.

However, lessons learned from other village water supply and sanitation programmes in rural areas show that the limiting factor in the sustainability of these facilities in the end are more influenced by the economic potential and economic impact of the facilities than only by the willingness to pay or by the training of the caretakers.

The sustainability of facilities will therefore generally be very low in marginal economic areas if the access to potable water and improved hygienic habits do not lead direct or indirect to more funds for repairs. In these conditions the maintenance will still depend on an outside governmental or donor input.

In several villages the project anticipated on this economic principle by stimulating the use of excess water for small-scale irrigation by the pump caretaker. Because of personal benefits this will indeed increase their own commitment with the functioning of the pump.

However, apart of the demonstration effects of these activities, the impact on the economic potential of the village as a whole is very limited.

There is a tendency in village water supply projects and also in this project, to put too much focus on the technical aspects of sustainability by only providing training to repair the hand-pump on VLOM-level. Although this training is appreciated and useful, the application of the VLOM principle as a general rule neglects the aspects of local capacity to pay for the necessary spare parts. It can easily lead to frustration if the handpump cannot be repaired only due to lack of funds. This frustration will have a negative effect on the socio-economic development of the community.

## 5. UTILISATION AND IMPACT OF FACILITIES

Utilisation and impact of the services are assessed by observation of behaviour of the population and specific indicators. Interviews and conversations with the villagers and the different maintenance groups provided additional information. For instance observations of usage of latrines will rather be obtained by a combination of subtle interviewing, combined with observations of usage and non-usage in the area of the latrine, than by observing the latrine itself which can be regarded as an invasion of privacy.

### 5.1. Utilisation and impact of the new handpumps

#### Health aspects

The specific impact of the World Relief Project on health and sanitation and the use of latrines is difficult to establish in a scientific correct way in the short period of the evaluation. However, in the discussions with the women in the communities a decrease in diarrhoea of their children was always mentioned as a most obvious result.

#### Environmental aspects

The environmental impacts of the creation of a large number of handpumps, often in or close to the village centres are also difficult to assess in the short time that these facilities are functioning.

Most obvious observations on the environmental impact is the low infiltration capacity of the soils for the spill water causing standing water near the pump. No depletion of the aquifers are to be expected due to the groundwater extraction by the handpumps of the project.

#### Economical aspects

In the villages the water is not only used for drinking purposes, but can and should also be used for agriculture purposes (seedbed, vegetable gardens and livestock ) and for construction works. Important aspects in this respects are the amount of water available, other alternative water sources, the location of the waterpoints and the potential of the socio-economic environment.

With the new waterpoints not only more water is available, but also especially the women will have more time for other activities. The economic impacts of these new activities are also important for the sustainability of the waterpoint.

The economical impacts of the waterpoints in this project differed from one village to the other. In several villages a considerable increase in activities due to the new available water was clearly visible; construction works of huts and houses but also sometimes for schools and hospitals, often initiated by other donors who immediately profits from the new infra-structure. However, a structural approach, or specific attention and support to the communities to profit the increase in time and water available was not present. These support actions should rather be part of specific independent and specialized follow-up projects that focuses on income generating activities than play an important part in a general rural water supply and sanitation project.

## **5.2. Utilisation and impact of the new latrines**

It is difficult to obtain in a short time objective representative information about the uses of sanitation facilities and health education. Moreover, the people in many villages already used to some extent pit latrines of a traditional model as a result from earlier sanitation programmes or from other sources.

By combination of interviewing and observations in the villages, a general, but not necessarily representative impression was obtained on the utilisation of latrines.

The most obvious observations are summarised below:

- latrine utilisation is significantly higher in the more dense populated villages and are used by men and women and to a lesser extend by children;
- when latrines were intensively used, this gave a unhygienic appearance due to smell and abundant flies;
- in several villages children and women did not use the same latrines as men;
- water to wash after defecation was generally not available in the latrines, but was provided for from the general household water;
- in the more extensive populated villages, the latrines utilisation and expected health impact is less, also because the adults spend most of their time on the fields with no latrine facilities;
- the INPF model seems to be less convenient for children under 5 years of age, but this observation could not be verified in the field.

## 6. INSTITUTIONAL FRAMEWORK

Institutional data was obtained through the study of project documents and complementary interviews with the project staff. Conversations with the governmental organisations as well with the beneficiaries supplied additional information on the functioning and constraints of the institutional framework in this sector.

The project worked in continued cooperation with the local and regional authorities on water and sanitation. For transfer of specific project data (borehole specifications, baseline studies, etc.) there was some confusion because the responsibilities and tasks of the local authorities in the water sector with respect to PRONAR is not clearly defined.

Part of the project staff had previously worked before with WRC or worked within the Governmental institutions (EPARs and EAR's). This approach facilitated the integration of the project activities within the Provincial institutional framework and provided at the same time "training-on-the-job" on all aspects of village water supply projects.

## 7. CONCLUSIONS AND RECOMMENDATIONS

This chapter summarises the main conclusions and recommendations of the evaluation of the project, as a results of the field observations and discussions with the project staff and the authorities.

It should be noted that it is beyond the scope of this evaluation mission to give detailed suggestions to improve certain technical and institutional aspects of the project. The recommendations have therefore a general character and can be described in more detail in additional studies.

### 7.1. The construction of boreholes

#### Preparation of documents

The project approach with a proper drilling contract worked out very well. With this contract the project gained value experience on specific technical, organisational and logistical problems in Mozambique for these kind of larger scale village water supply projects in development programmes.

*It is recommended that for similar projects the drilling contracts are reviewed using the new project experience, with specific attention to:*

- *supervision on technical, safety and financial aspects;*
- *access of sites;*
- *drilling techniques appropriate to local hydrogeological conditions;*
- *completion, sealing and disinfection of the borehole;*
- *avoiding inclination of the borehole;*
- *additional activities of the contractor.*

#### Siting of boreholes

Several boreholes revealed salt or brackish groundwater, unsuitable for drinking. After the animation of a village it is highly frustrating to abandon the borehole due to the poor quality of the groundwater.

*It is recommended to perform a geophysical siting study well in advance of the drilling activities in hydrogeological difficult areas, not only to determine suitable drilling locations, but also to determine the expected minimum drilling depth (and therefore borehole costs) before the borehole can be abandoned.*

#### Project report and handpump dossier

The project report gave a good overall view of activities and all borehole characteristics, but the individual pump and borehole data is not easily accessible.

*It is recommended in village water supply projects to supply for each individual handpump a small dossier, with a photo of the pump and its surroundings and all relevant technical data of the pump and the borehole.*



## 7.2. The construction of the superstructure

The project had only general Governmental outlines for the superstructure design and local construction workers were relatively free to make own variations with sometimes undesirable results.

*It is recommended that at least the following design criteria are met for the apron and superstructure of the waterpoint:*

- *the form of the spill water floor should not be convex but concave and guide the water over the shortest distance to a concrete open outlet to an improved infiltration pit at least 10 meters from the borehole;*
- *on the actual water intake point the cement surface should be stronger and preferably elevated;*
- *outside of the spill water rim, at least one cement platform should be present to place the empty and full water buckets;*
- *it must be possible for two persons to operate the handpump, while standing on a cement platform.*

## 7.3. The installation and repairs of handpumps

The project team gained valuable experience in the installation and repair of the handpumps, especially with the proper installation and repair of the rising mains, both for Afridevs and Volantas pumps.

*It is recommended to start a follow-up project to summarize the projects experience (and that of other similar projects in Mozambique) in a field handbook that focuses on practice procedures and problem solving in the installation and repairs of the handpumps in Mozambique.*

## 7.4. The installation of handpumps in deep boreholes

The project experienced a high number of leaking and broken rising mains in the deeper boreholes equipped with the Volanta pump.

*It is recommended to improve the reliability of the Volanta handpumps in boreholes with deep waterlevels to start a pilot project with improvements that include the following aspects:*

- *a large number of good fitting centralisers to avoid the horizontal movement of the rising main;*
- *a pump cylinder with an smaller external diameter (40 mm. in stead of 50 mm.);*
- *to enable more persons (up to four) to pump, a larger superstructure apron, an extension handle on the wheel and on the other side of the borehole an additional apron with the same superstructure with an extra handle.*

*It is furthermore recommended that this study should be followed by a workshop to communicate the results of these improvements with all organisations working in the water infra-structure sector.*

## 7.5. The sustainability of handpumps and welfare

The sustainability of handpumps depends mainly on the financial and technical capacity of the responsible institutional framework. There is a tendency, also in this project, to put to

much focus on the technical aspects only.

*It is therefore recommended, especially in the economic marginal areas, to assist the communities with special follow-up programmes using the new waterpoints. These programmes should pay special attention to new income generating activities (e.g. livestock breeding, seedbed, vegetable gardens, construction and commerce, etc.) due to:*

- *more water available;*
- *more time available.*

## **7.6. Animation and communication with the communities**

In the project base-camp demonstration latrines were constructed and also used by the project team. This proved to be a very efficient way of demonstrating and setting hygiene standards for the villagers.

*It is recommended that in similar animation activities a decentralised approach with demonstration base-camps is used for better contact with the communities and to also demonstrate the message rather than to tell the message only.*

Communication of educational matters in rural areas to large groups in meetings is less effective. People sometimes rather work on their fields than to show up on a meeting, whereas also the social behaviour in meetings due to cultural habits often hampers the discussions or masks the existing problems.

*It is recommended that especially women are approached and educated in their own surroundings by home visits, and not in large groups.*

The project worked in several types of villages (rural dispersed communities, communal villages and small towns). The project staff gained experience with the specific characteristics of each type of community and adapted a custom made approach in the animation, training of pump caretakers and in the implementing of a user-fee system for each type of community.

*It is recommended that in rural village water supply a flexible institutional approach can be implemented rather than to impose a rigid institutional framework that doesn't take into account the local socio-economical and political constraints.*

It is often difficult to get people together for training and for exchange of experience. However, the waterpoint is often a regular and common place of contact, especially for the women.

*It is recommended that the location of the new waterpoints, especially those where people often spend a lot of time waiting, are considered to be used for communication or education, or other communal activities. Even commercial activities (production and selling) may be considered in some cases.*

## **7.7. The construction and utilisation of latrines**

### Design and construction

The standard model of the INPF programme has some practical disadvantages. Especially the lid breaks very easily and often falls into the latrine pit.

*It is recommended that:*

- *the top will be redesigned in order to make it impossible to fall into the pit of the latrine;*

- the rope that should prevent the top from falling into the latrine should be sufficiently long and not touching the ground and therefore rather be attached to the ceiling than to the wall.

#### Use and hygienic conditions

The hygienic situation of a latrine decreases with the number of people using the same latrine.

*It is recommended that in the animation especially the status of private use of latrines (one per household) is emphasized.*

#### Acceptation

Most villagers are aware of the fact that the proper use of latrines can avoid diseases. However, the actual acceptance, construction and use of latrines is more influenced by the status and convenience the latrine gives than by the expected health benefits.

*It is recommended that in the animation the motivation of latrines is not only focused on health aspects, but that the practical aspects of status and convenience are also used in order to increase the use of latrines.*

### **7.8. Institutional aspects**

#### Pump caretakers

From the (generally) four people that formed the community water source caretakers per pump generally one or two persons remained active in necessary activities.

*It is recommended that for each waterpoint preferably only one person (chosen by the community) with one or two assistants, is responsible for the operation and maintenance of that particular waterpoint.*

#### Local organisations

Local organisations on community levels as for instance the Mozambican Woman organisation (OMM) often have already an operational structure and are often familiar with aspects of training.

*It is recommended to integrate all project activities in an early stage in the project with the existing organisations on community level.*

#### Training and support

The project incorporated very well personnel of EPAR/EAR in the project training and construction activities and trained EPAR/EAR and project staff for post-project activities in maintenance of the handpumps.

*It is recommended that institutional aspects have at least equal priority in rural water supply projects as respect to the realisation of facilities, to secure the sustainability of the activities. Sufficient budget for training and additional support for institutional infra-structure (housing, transport and communication facilities) should be incorporated in project planning.*

#### Coordination with other Ministries

The projects education programme on water and sanitation worked in cooperation with the Community Participation and Hygiene Education (PEC) and the hospital in Chokwe.

*It is recommended for similar education programmes on sanitation within water supply projects, to work in close cooperation with the health programmes under the coordination of the Ministry of Health.*

#### Transfer of project data

For transfer of specific project data there was some confusion about the institutional responsibilities and tasks of the local and Provincial authorities in the water sector with respect to PRONAR.

*It is recommended that before the start of similar projects the procedure of transfer of selected project data should be clearly defined with the Governmental organisations.*

### **7.9. Organisation of water supply and sanitation projects**

Construction of facilities, baseline studies, educational and socio-economical activities, training and institutional support require all a different approach and a different time to implement and are difficult to realise within one project.

*It is recommended that in the design and planning of rural water supply and sanitation projects, "soft-ware" activities that require more time to implement are not dependent or pressed on by the "hard-ware" (construction) tight-scheduled activities.*

### **7.10. Organisation of regional mobile pump repair units**

For the period of one year a World Relief post-project technical assistance project was proposed, the Mobile Maintenance and Monitoring Unit (MMM-Unit).

*It is recommended to start a project to support this MMM-Unit with backstopping and training, followed by an evaluation to estimate the feasibility of future mobile support units.*

## **ANNEX 1. Expected "End-of-Expanded Activity Status"**

For the Terms of Reference (TOR) of this evaluation mission, the following aspects were indicated to overview. At the conclusion of the project, World Relief Corporation (WRC) expects to have completed and/or achieved the following:

1. 70 deep boreholes and 78 shallow boreholes drilled.
2. 110 boreholes fitted with operating hand pumps providing potable water. Each borehole has a cement apron and drain and the hand pump mounted on a sealed well head.
3. 8 model latrines constructed, cleaned, functioning and being copied by villagers.
4. 40 communities participated in the project activities with a total beneficiary population of about 74,000.
5. Clean water at the rate of one well for 500 people, providing at least 10 litres of potable water per person per day provided for each community.
6. 74,000 beneficiaries received at least 10 litres a day per person of potable water from the 110 boreholes.
7. 110 village level water committees formed and trained in use and management of water, sanitation and in hygiene topics related directly to water and sanitation.
8. 220 community water source caretakers trained and equipped for pump repair and water point maintenance (2 per water point) with an adequate gender balance of participants.
9. 60 health groups created and trained in proper borehole use and water/sanitation education.
10. 100 % of well users received water and hygiene education which included: the safe transport and storage of water; the connection between clean water, good hygiene and good health; diarrhoea prevention and ORT; latrine promotion and maintenance; the correct use of pumps and wells; and the correct disposal of garbage.
11. A user-fee system established for each of the 110 functioning boreholes.
12. 17 community water committees had a functioning user-fee system which covered the recurrent costs of the well.

**ANNEX 1. Expected "End-of-Expanded Activity Status"**

**(continued)**

13. 2 water teams of 3 persons trained in the operation and maintenance of manually operated drilling rigs and used by WRC to drill up to 78 shallow wells.
14. A water quality, well head conservation and environmental impact monitoring system established for 110 boreholes.
15. Diarrhoeal diseases in children under 5 years decreased by 40%.
16. 30% of the targeted families built latrines for their own use based on the WRC model.
17. Productive and environmentally safe end uses for the well run-off water developed for 70% of the wells.

## **ANNEX 2. Working Programme of the Evaluation:**

The evaluation of the World Relief Water Supply project in the Gaze Province was executed by Mr. Paul van Beers of SAWA-Mozambique, Consultant for Development from Friday 1st to Friday 8th of December, 1995. Transport was supplied for by World Relief. The detailed daily programme is outlined below.

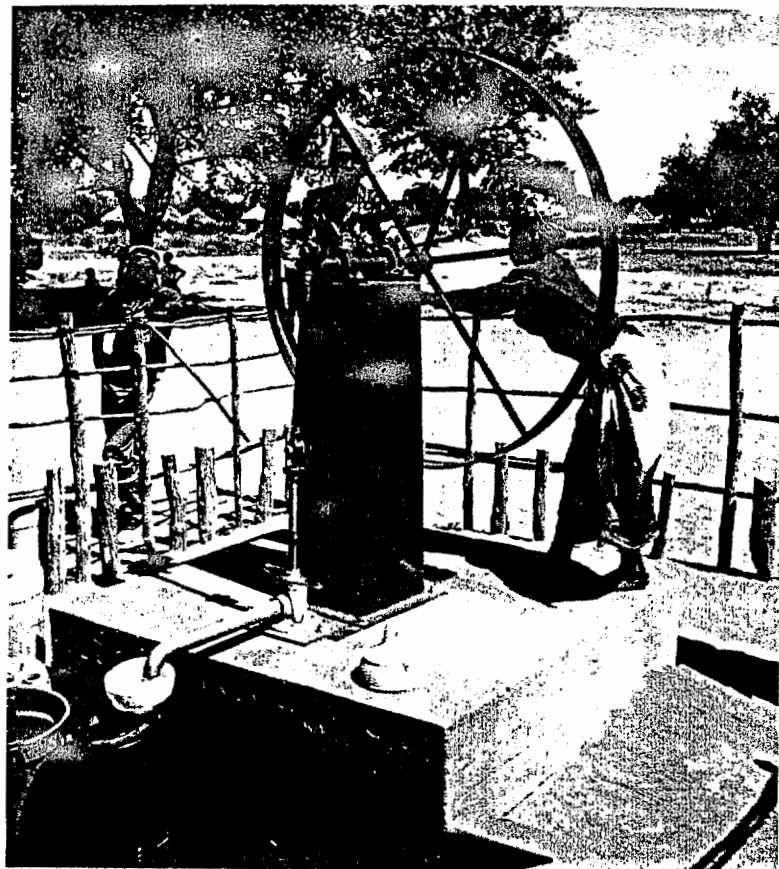
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| Friday, 1st    | Arrival Chokwe: <ul style="list-style-type: none"><li>- review documents and data;</li><li>- interviews with project staff Mr Steve Ray (Field Director and Hydrogeologist) and Mrs Linda Olga Nghatsane (Supervisor Animation).</li></ul>   |
| Saturday, 2nd  | Chokwe: <ul style="list-style-type: none"><li>- field visits to Guija with Steve Ray, accompanied by Mr Salima (pump-technician and driver), Mrs Esperanca Muchanga and Mrs Vitoria Poule (Section Animation).</li></ul>   |
| Sunday, 3rd    | Chokwe: <ul style="list-style-type: none"><li>- Field visits to Mabalane with Steve Ray, accompanied by Mr Salima (pump-technician and driver), Mrs Esperanca Muchanga and Mrs Vitoria Poule (Section Animation).</li></ul>  |
| Monday, 4th    | Fly from Chokwe to Massangena with Air Serve, in Massangena: <ul style="list-style-type: none"><li>- meeting with Administration, conversations with Mr Damiao Mabunda (adjunct Administrator) and Mr Jorp Machava (chef secretariat).</li><li>- field visit to Massangena with Steve Ray, accompanied by the MMM-Unit (Mr Juma, Mr Bendami and Mr Calanga).</li></ul> |
| Tuesday, 5th   | Massangena: <ul style="list-style-type: none"><li>- field visit to Massengena, accompanied by the MMM-unit;</li><li>- review of repair Afridev handpump by community;</li></ul>  |
| Wednesday, 6th | Drive from Massangena to Mapai: <ul style="list-style-type: none"><li>- visits handpumps on the way to Mapia in Mapungane, Mafacitela and Mapai;</li><li>- review of repair of Volanta pump by the community;</li></ul>  |
| Thursday, 7th  | Morning: field visits Mapai: <ul style="list-style-type: none"><li>- assessment of deep-well technical problems;</li></ul> Afternoon: Fly from Mapai to Chokwe, in Chokwe: <ul style="list-style-type: none"><li>- review of project data;</li><li>- discussions with project personnel</li></ul>  |
| Friday, 8th    | Morning in Chokwe: <ul style="list-style-type: none"><li>- review of field experiences with project staff, Mr. Steve ray and Mrs Linda;</li></ul> Afternoon: Drive from Chokwe to Maputo.  |

### **ANNEX 3. PHOTOS OF THE FIELDVISITS**

- Photo 1. The Volanta handpump, recommended for boreholes with waterlevels beyond 50 m. The project insisted on an effective protection of the handpump and apron by a wooden fence.
- Photo 2. The Afridev handpump, the standard handpump for rural water supply in Mozambique. The area around the pump is kept very tidy by the caretakers.
- Photo 3. Pump caretaker with her financial administration of participating households for her pump. The long line of around 35 buckets indicates a waiting time of at least two hours.
- Photo 4. Bush repair procedure of the Afridev handpump. When the rising main has to be taken out, the communities invented their own more economic way of repairing a broken rising main to avoid the expensive cutting of every three meters of the tube and the costly gluing of new couplers.
- Photo 5. Demonstration latrine in a village. Often the latrines were not completed with a roof.
- Photo 6. Typical standard project latrine slab, with the broken top, the rope that should prevent the top from falling into the pit is often missing.
- Photo 7. A new project improved pit latrine (with a door and windows) was constructed near the remains of a traditional latrine.
- Photo 8. In several villages the disposal of a special designed private latrine gave additional status to the owner. Here an improved copy of a pit latrine with a ventilation pipe.



ANNEX 3 Photo 1 and 2

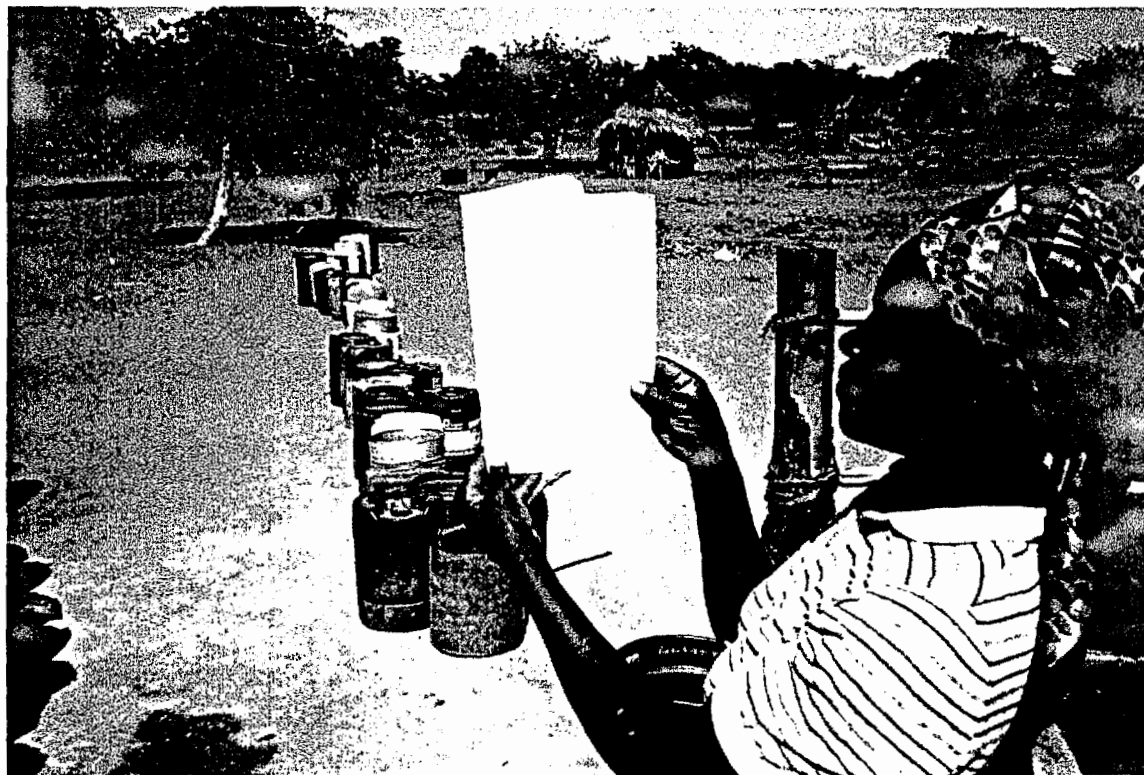


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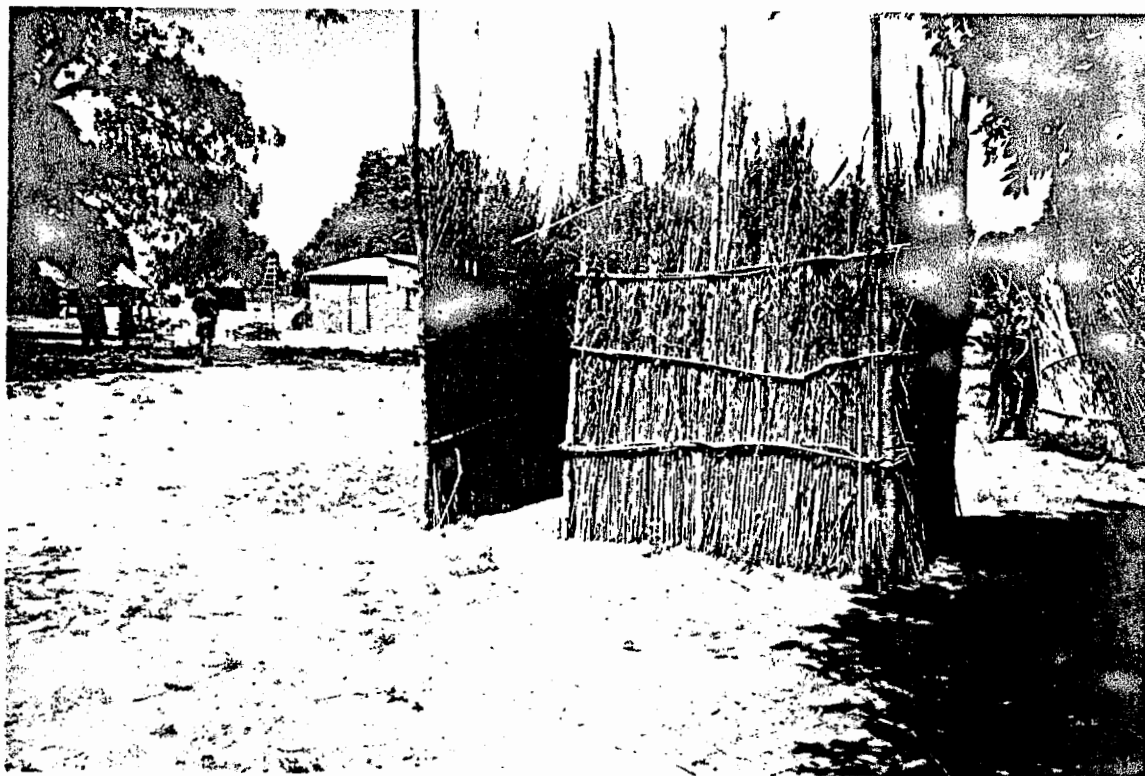
**ANNEX 3 Photo 3 and 4**



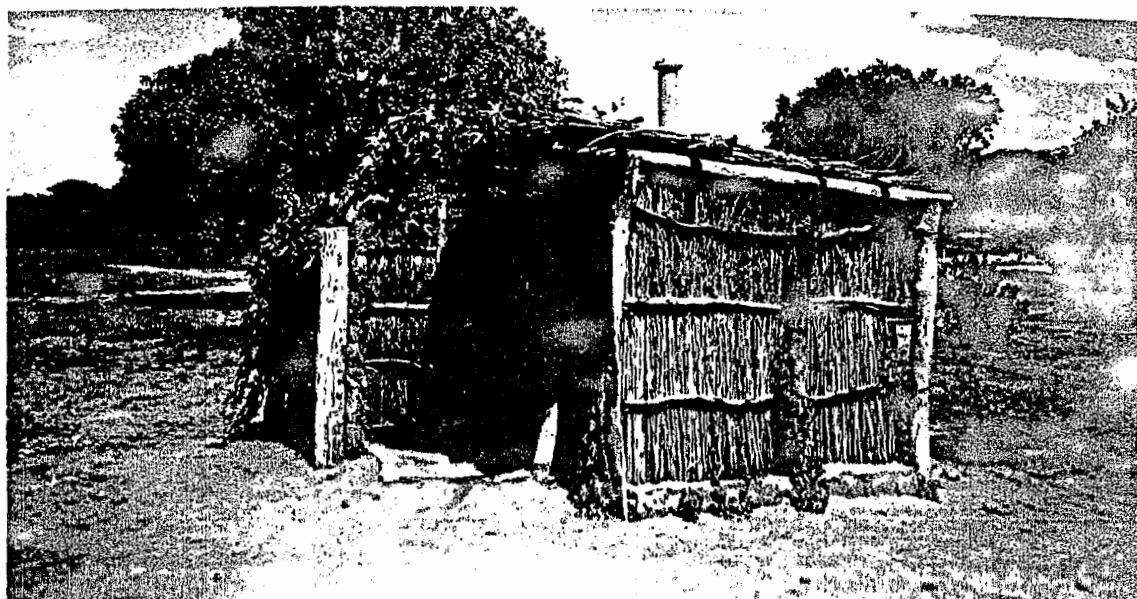
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**ANNEX 3 Photo 5 and 6**



**ANNEX 3 Photo 7 and 8**



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